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COMMERCIAL TECHNICAL MANUAL

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DECoy
RIBBON
BRIDGE



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2 Encl

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Subject Area: Ribbon Bridge Decoy.

DAAK70-87C-0055 - Note: DTIC would appreciate receiving all technical reports generated on cited contract, including interim, progress and final, etc. If the contract results were published as a thesis, journal article or proceeding paper, please forward.

Enclosure (1) provides information on this particular work unit.

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CHAPTER 1

INTRODUCTION AND SYSTEM DESCRIPTION

GENERAL

- The Decoy Ribbon Bridge is a fabricated inflatable decoy bridge system that replicates the visual and radar signatures of an actual ribbon bridge. This Technical Manual contains information necessary for the deployment, operation, and maintenance of the Decoy Ribbon Bridge system.

Chapter 1 contains the system description.

Chapter 2 contains deployment and operation instructions.

Chapter 3 contains maintenance instructions.

Chapter 4 contains a material parts list.

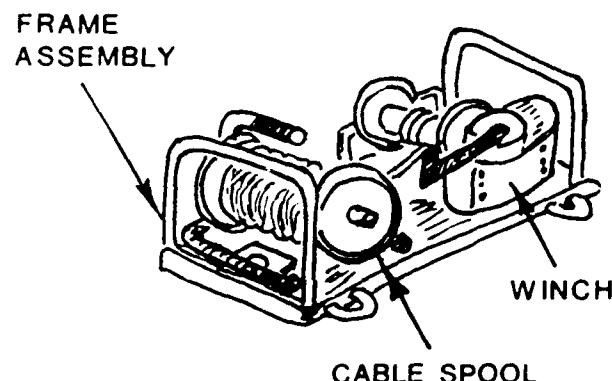
SYSTEM DESCRIPTION

The Decoy Ribbon Bridge is an inflatable bridge that replicates an actual ribbon bridge. It is assembled in sections that are connected together to form a chained assembly. There are two ramp sections that are used to terminate each end. The chain of inflated sections is held into place by a steel cable placed across the river. Inflation pressures are controlled and maintained automatically during inflation and normal operations.

The Decoy Ribbon Bridge consists of the following components:

Cable Deployment Assembly (SK8274-10209-01)

One Cable Deployment Assembly is required for each bridge deployment. The cable frame assembly consists of a self contained winch that is used to take up slack in the deployed cable. It also comes with a 600 ft spool of 3/16 inch stainless steel cable. One end of the spooled cable comes attached to the take-up winch. During deployment, the frame holding the winch is anchored to the river bank. The spool of cable is removed from the frame assembly and unwound as it is transported across the river. Steel pickets are used to anchor the cable and frame assembly.



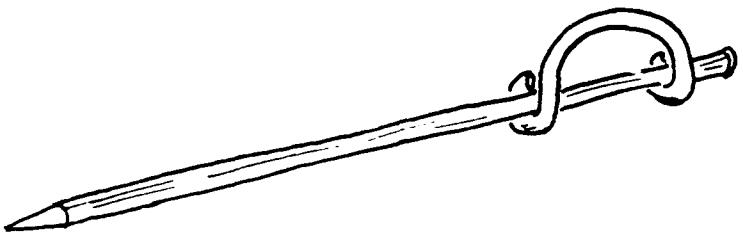
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SYSTEM DESCRIPTION - (Continued)

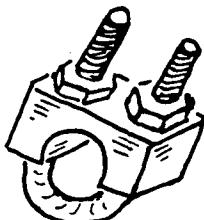
Steel Picket, Type II (NSN 5420-00-371-9897)

The steel pickets are used to anchor the cable and the cable deployment frame assembly to the river banks. The quantity of pickets needed will vary depending on existing soil conditions. Enough pickets must be used to ensure a holding force of at least 2000 lbs.



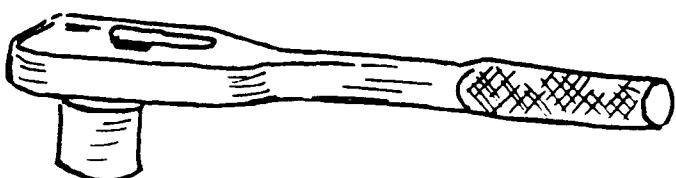
U-bolt Cable Clamp (P/N To Be Supplied)

Four U-bolt clamps are required to secure the spool end of the cable to the steel pickets on the opposite river bank. The cable is first looped through the eyes of the steel pickets then fastened together using the cable clamps.



Ratchet Wrench Assembly (P/N To Be Supplied)

The ratchet wrench is used to tighten the cable clamp U-bolts. It comes with a 7/16 inch socket.

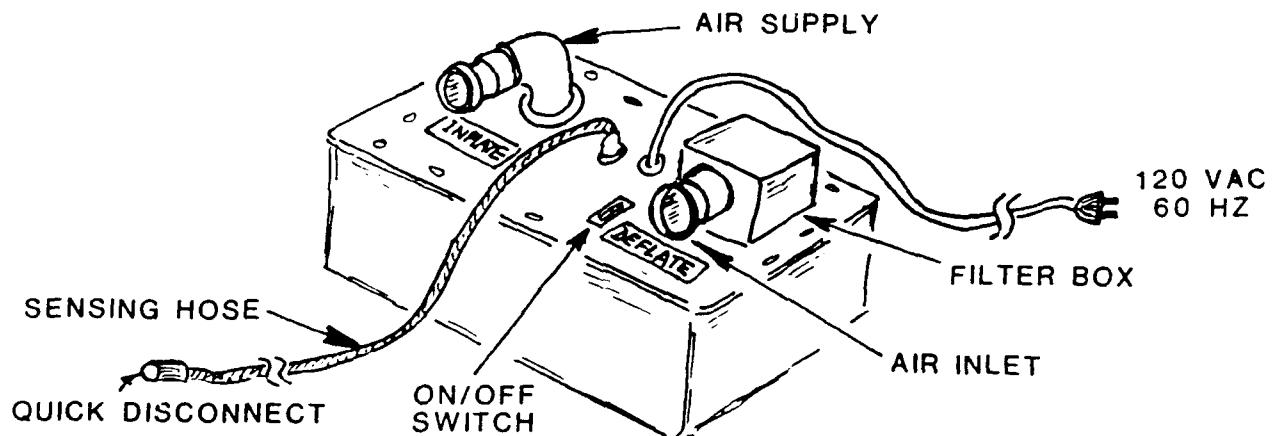


SYSTEM DESCRIPTION - (Continued)

Inflation System (SK8274-10217-01)

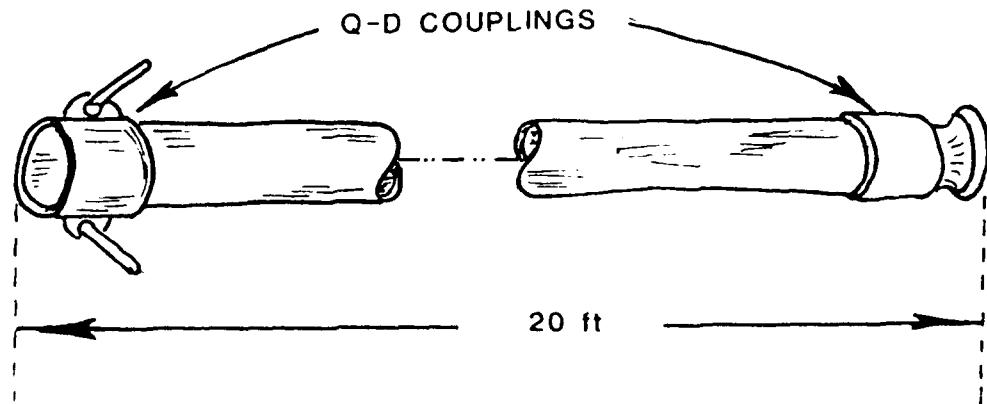
One inflation system is required for each bridge deployment. The inflation system consists of a portable motor blower unit that is operated by a 120 VAC, 60 Hz, electrical power source. It uses a pressure sensing hose to automatically maintain pressures between 3/4 and 1 1/2 PSI.

When the supply hose is connected to the deflate port (Air Inlet), the unit acts as a vacuum source during deflating operations.



Inflation Hose Assembly (SK8274-10207-01)

One inflation hose assembly is required for each bridge deployment. The inflation hose is used as the main pressure supply line. This 1 1/2 inch I.D. hose is 20 feet in length and comes with two quick-disconnect couplings. It connects the motor blower unit to the interconnecting hose assembly.

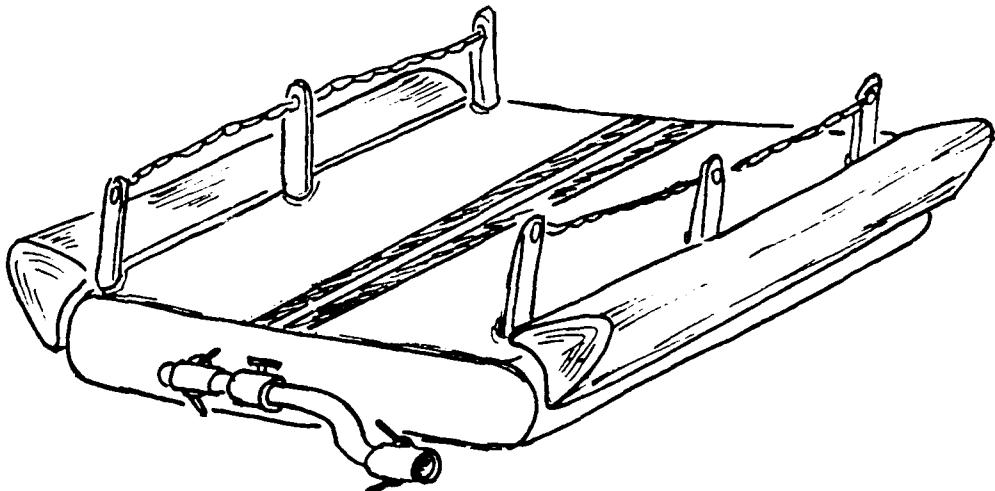


SYSTEM DESCRIPTION - (Continued)

Interior Bay Assembly (SK8274-10165-01)

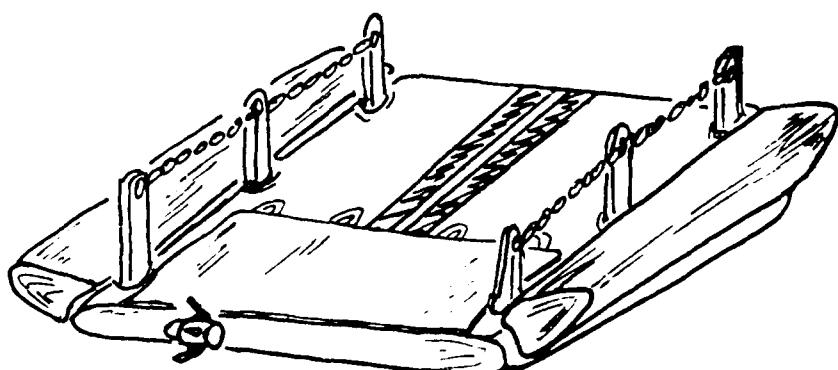
The interior bay assemblies are inflatable bridge sections that replicate actual bridge sections. Each bay section is about 22 feet in length. The number of sections or assemblies needed will depend on the river width and the desired span of the bridge.

The inflated sections are connected to a ramp bay or other interior bay sections to form a chained bridge. They are secured by crisscrossed straps and buckles. An interconnecting air hose assembly is used to connect the bay section pressure chambers together. After the sections are inflated, they are connected to the steel cable and floated across the river.



Ramp Bay Assembly (SK8274-10166-01)

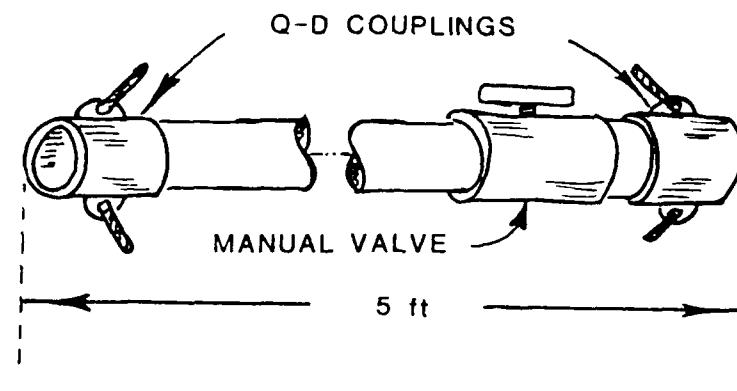
There are two ramp bay assemblies required for each bridge deployment. The ramp bay assembly is an inflatable bridge section that replicates actual bridge ramps. The ramp sections are connected to other interior bay sections to form the ends of the chained bridge. They are secured by crisscrossed straps and buckles. An interconnecting air hose assembly is used to connect the bay pressure chambers together.



SYSTEM DESCRIPTION - (Continued)

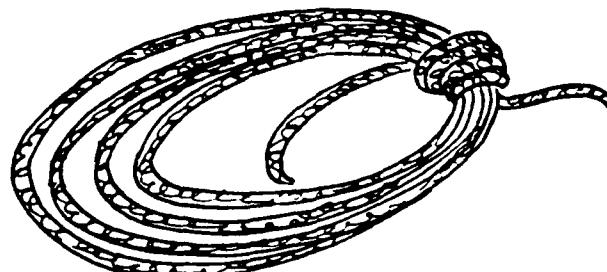
Interconnecting Hose Assembly (SK8274-10206-01)

The interconnecting hose assembly connects each bay pressure chamber together to form a single integrated pressurized system. The interconnecting hose assembly consists of a 5 foot, 1 1/2 inch I.D. hose and valve assembly with two quick-disconnect couplings. The valve is manually closed as a new section is being added to the bridge chain. It is opened as the new section is being pressurized.



Shore Rope Assembly	(SK8274-10241-01)	230 ft
	(SK8274-10241-02)	150 ft
	(SK8274-10241-03)	90 ft

The shore rope assemblies replicate the shore guy lines used on actual ribbon bridges. The number of lines deployed and their location will depend on what is required to simulate those of an actual bridge. The shore ropes are fastened to the bridge through the same clips that fasten the bay assemblies to the mooring cable. These rope assemblies also help to secure the decoy bridge assembly.



EQUIPMENT SPECIFICATIONS

ITEM	SPECIFICATIONS
Ramp Bay Assembly (SK8274-10166-01)	Length: 18 ft Width: 27 ft Height: 2 ft Weight: 210 lbs
Interior Bay Assembly (SK8274-10165-01)	Length: 22 ft Width: 27 ft Height: 2 ft Weight: 235 lbs
Cable Deployment Assembly (SK8274-10209-01)	Length: 19 1 in Width: 15 6 in Height: 13 7 in Weight: 103 lbs
Interconnecting Hose Assembly (SK8274-10206-01)	Length: 5 ft Inside Dia.: 1 5 in Weight: 4 lbs
Inflation System Assembly (SK8274-10217-01)	Length: 23 in Width: 18 in Height: 14 in Weight: 43.5 lbs
Inflation Hose Assembly (SK8274-10207-01)	Length: 20 ft Inside Dia.: 1 5 in Weight: 13 lbs
Shore Rope Assemblies (SK8274-10241-01)	Length: 230 ft Diameter: 0.5 in
(SK8274-10241-02)	Length: 150 ft Diameter: 0.5 in
(SK8274-10241-03)	Length: 90 ft Diameter: 0.5 in

SAFETY SUMMARY

The procedures in this technical manual should be read and understood by the user before undertaking the deployment of a Decoy Ribbon Bridge. The user should be totally familiar with the hazards that may be encountered during the deployment and operation of the Decoy Ribbon Bridge. Extreme care and precaution should be taken to prevent and avoid those hazards.

As a minimum:

- * Use care when handling all electrical components.
- * Do not exceed the maximum recommended cable tension.
- * Do not operate the Decoy Ribbon Bridge above the maximum recommended operating pressure.
- * Be sure deployment of the Decoy Ribbon Bridge is accomplished according to recommended procedures.
- * Use general water safety precautions while operating in, on, or over the water.
- * Do not pressurize system with sensing hose disconnected.
- * Wear gloves when handling steel cable.
- * Replace a frayed or broken steel mooring cable.
- * Do not over-tension the steel mooring cable.
- * Keep portable generator away from inflatable components.
- * Use care not to puncture inflated bays with raft or boat while connecting shore guy lines to the interior bays.
- * Make repairs involving solvents in a properly ventilated area.

WARNING

WARNINGS contain information necessary to preclude or prevent injury to personnel.

CAUTION

CAUTIONS contain information necessary to preclude or prevent damage to equipment.

NOTE

NOTES contain information essential to the associated operation or procedure.

Warnings and Cautions normally precede the procedural step to which they apply. Notes may precede or follow the procedural step depending upon the nature of the information being presented.

CHAPTER 2

EQUIPMENT DEPLOYMENT AND OPERATION

GENERAL

This chapter contains the instructions and procedures necessary to deploy and operate the Decoy Ribbon Bridge. Sequentially numbered procedural steps should be performed in the order in which they are listed.

ASSEMBLY PREPARATIONS

Site Selection

Select a site on each side of the river with the following restrictions and general characteristics:

- * The line where the bridge will cross the river should be less than 328 ft (100 meters).
- * The approach areas should give the appearance of accessibility by a 2 1/2 ton truck.
- * A minimum area 30 ft x 30 ft of cleared level ground on the deployment side of the river is required to facilitate the unfolding and inflation of the ramp and interior bay sections.
- * The selected site should have similar river and approach characteristics that are required for the deployment of an actual ribbon bridge.

Site Preparation

Check the deployment site for any obstacles that will create a puncture hazard while the bridge sections are being inflated and deployed. Remove all rocks, sharp objects, and debris from the cleared deployment area (30 ft x 30 ft).

Clear a road pathway to the nearest access road. Pathway should simulate an unimproved road surface capable of handling a 2 1/2 ton truck.

Required Equipment Selection

Generator

A generator is required to furnish electrical power to the inflation system. The generator selected must be capable of supplying 120 VAC, 60 Hz, with a minimum power rating of 2000 Watts. The generator should also be capable of handling a momentary start up power surge of 40 Amps.

Ribbon Bridge Component List

Component	Qty
Ramp Bay Assembly	2
Interior Bay Assembly	As Req
Interconnecting Hose Assy	As Req
Inflation Hose Assembly	1
Inflation System Assembly	1
Shore Rope Assembly (230 ft)	As Req
Shore Rope Assembly (150 ft)	As Req
Shore Rope Assembly (90 ft)	As Req
Cable Deployment Assembly	1
U-Bolt Cable Clamp	4
Ratchet Wrench Assembly	1
Steel Picket, Type II	As Req
Bay Strap Assembly	As Req
Tent Stakes	8
Hammer (Item not provided)	1
Tape Measure (Item not provided)	2

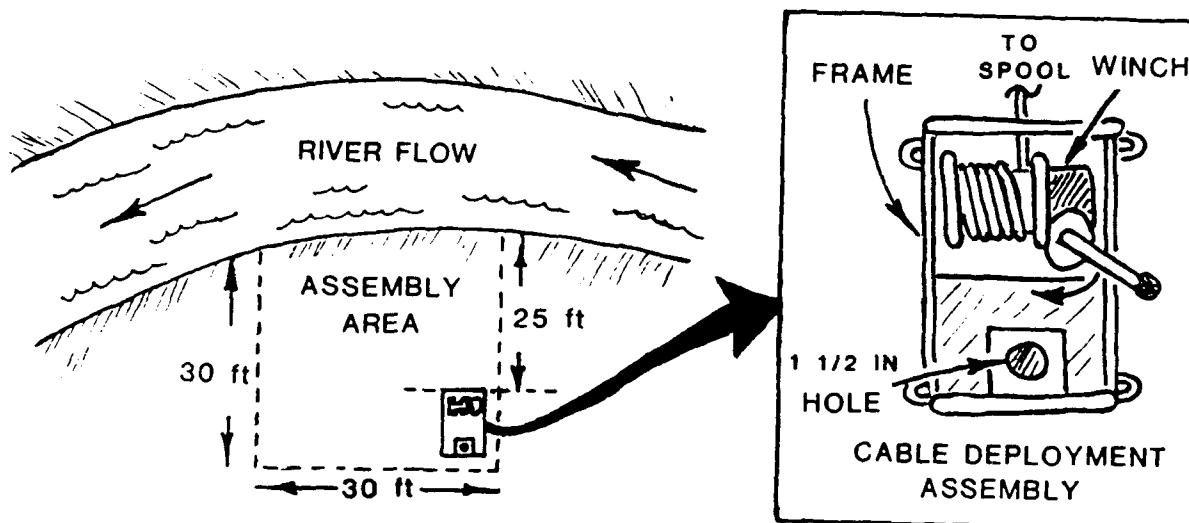
BRIDGE ASSEMBLY

Uncrating Components

1. Remove lag bolts from one end of crate.
2. Unpack the following components from shipping crate:
 - * Cable Deployment Assembly
 - * Steel Pickets, Type II
 - * U-bolt Cable Clamps
 - * Ratchet Wrench Assembly
 - * Hammer

Deploying Cable Assembly

1. Position cable deployment assembly at least 25 ft from river bank on upstream side of cleared assembly area (See figure below).



2. Position frame assembly so side with winch is facing nearest to river.

NOTE

The winch take up spool should be parallel to the river bank.

3. Ensure cable deployment frame assembly is level.

Deploying Cable Assembly - (Continued)

4. Remove cable spool from frame assembly as follows:
 - a. Unclip 1 inch wide green retaining strap.
 - b. Lift spool out of cable deployment assembly.
 - c. Position spool about five feet from winch.

NOTE

The cable between the winch and spool should be straight with no kinks.

5. Drive steel picket through 1 1/2 inch hole in frame located on the side opposite the winch.
6. Drive enough additional steel pickets to ensure holding force of 2000 lbs (Refer to Department of Army TM 5-725).

NOTE

Any additional pickets or trees, etc. used for staking and securing the deployment frame assembly must be attached to this picket.

7. Place needed items in boat or raft to be used for river crossing:
 - a. Appropriate number of steel pickets.
 - b. Hammer.
 - c. Four U-bolt Cable Clamps.
 - d. Ratchet Wrench Assembly.

WARNING

Gloves should be worn when handling cable to prevent cuts, scrapes, and skin punctures caused by a frayed cable.

CAUTION

The cable should be inspected as it is unwound. A frayed or broken cable must be replaced to eliminate puncture hazards and the possible use of a weaken cable.

8. Unwind and inspect cable while placing spool in boat or raft.
9. Position cable spool so it can be unwound as boat or raft crosses river.

Deploying Cable Assembly - (Continued)

10. Tighten wing nut as necessary to set cable spool drag.

WARNING

Gloves should be worn when handling cable to prevent cuts, scrapes, and skin punctures caused by a frayed cable.

CAUTION

The cable should be inspected as it is unwound. A frayed or broken cable must be replaced to eliminate puncture hazards and the possible use of a weaken cable.

NOTE

Before crossing river, estimate river current and if possible begin river crossing upstream of the designated target point on opposite side of river bank at which the deployment cable will be staked. This will compensate for boat drift encountered while crossing river.

11. Unwind and inspect cable as you cross the river.

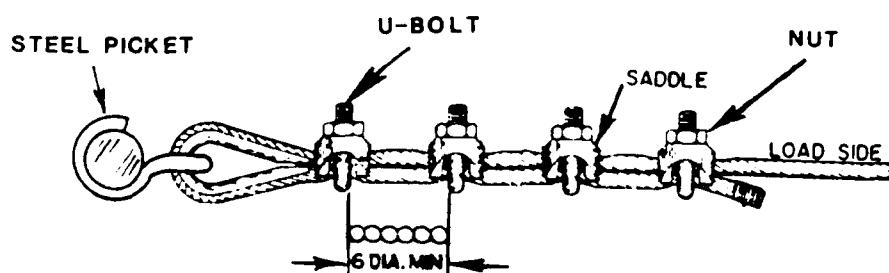
AFTER REACHING OPPOSITE RIVER BANK

12. Unload items from raft or boat.
13. Select spot to anchor cable.
14. Drive steel pickets into ground.

NOTE

Use enough pickets to ensure a holding force of 2000 lbs. The number of pickets needed will vary according to existing soil conditions (Refer to Department of Army TM 5-725).

15. Secure cable to pickets using the four U-bolt cable clamps (See figure below).



Deploying Cable Assembly - (Continued)

16. Use ratchet assembly to tighten U-bolt nuts.

NOTE

Tighten U-bolt clamps by alternately turning nuts in a clockwise direction until U-bolt saddle bottoms out and nuts are tight.

17. The deployment cable is now secured on both sides of the river bank.

AFTER RETURNING TO THE CLEARED ASSEMBLY AREA

WARNING

Do not over tension the steel mooring cable. Tighten the cable until entire length of cable is just above water level or 2000 lbs. of tension is obtained. Using a tension gauge, ensure the cable tension does not exceed 2000 lbs. during cable tightening. Over tightening may cause injury to personnel or damage to equipment.

18. Take up cable slack by turning winch crank handle clockwise.
19. Tighten cable until entire length of cable is just above water level or 2000 lbs. of tension is obtained.

Preparing Inflation System

1. Place inflation system on downstream side of deployment area.

NOTE

The inflation hose assembly is 20 ft long; therefore, the inflation system must be placed within 20 ft of the bridge bay inflation ports.

CAUTION

Inflatable components should not contact hot parts of the generator.
Damage to equipment may occur.

2. Place portable electrical generator within 8 ft of inflation system assembly.
3. Uncoil inflation system 8 ft power cord.
4. Check that inflation system on/off switch is in OFF position.

Preparing Inflation System - (Continued)

5. Start generator per operating instructions.

CAUTION

Be sure power cord plug is dry and free of debris before plugging into generator outlet.

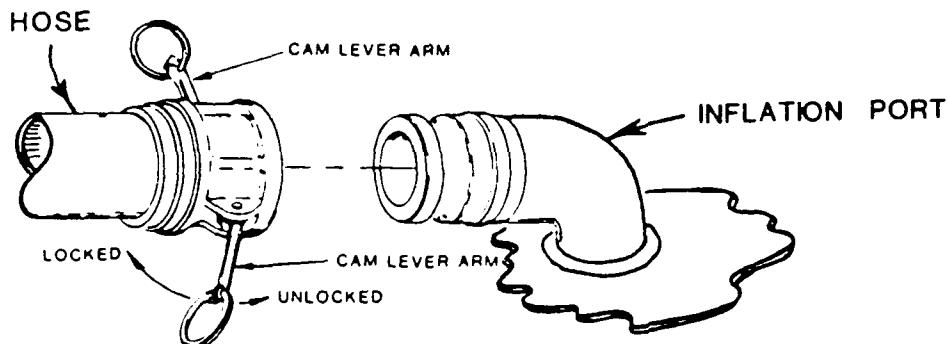
6. Connect inflation system power cord to generator 120 VAC power outlet.
7. Uncoil black 20 ft pressure sensing line (1/4 in diameter) located inside inflation system lid.
8. Unpack 20 ft inflation hose assembly and uncoil.

NOTE

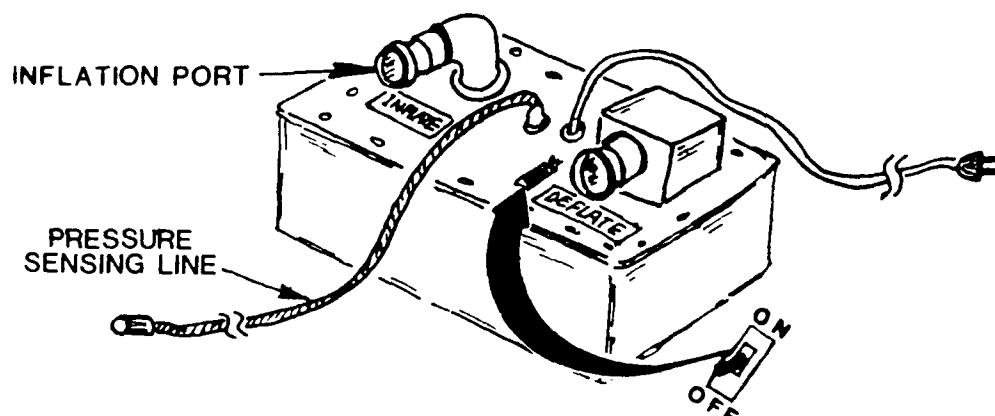
When joining the quick-disconnect couplings, ensure that both fittings are clean. Check that the female receptacle has a serviceable gasket.

To lock connection, simultaneously push both cam lever arms fully closed (See figure below).

INTERCONNECTING HOSE



9. Connect inflation hose to port labeled "INFLATE" (See figure below).



Installing 1ST Ramp Bay Section

1. Unpack Ramp Bay Assembly from shipping jacket.
2. Place Ramp Bay Assembly on cleared assembly area and unfold.

NOTE

Position the ramp bay assembly so, when inflated, the extension flap end of the ramp is facing the opposite river bank.

3. Check that inflation port on end of ramp bay (side closest to river) is capped.

NOTE

When joining the quick-disconnect couplings, ensure that both fittings are clean. Check that the female receptacle has a serviceable gasket.

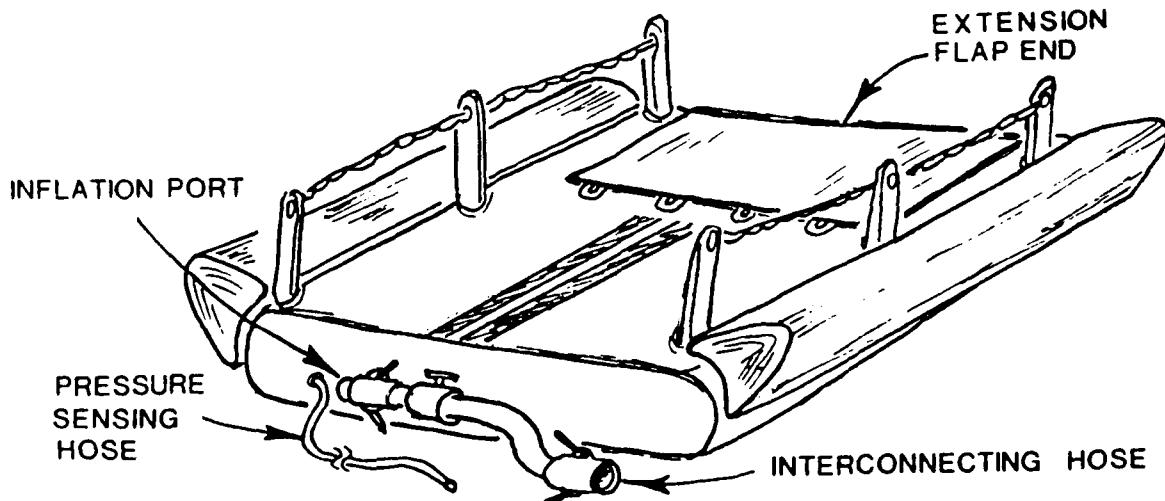
To lock connection, simultaneously push both cam lever arms fully closed.

4. Remove cap from inflation port on end of Ramp Bay opposite from extension flap.

CAUTION

Failure to connect the pressure sensing line to the section being inflated may result in over-pressurization. Damage to equipment may result.

5. Attach pressure sensing line to ramp bay section. Connection is located next to inflation port (See figure below).



Installing 1ST Ramp Bay Section - (Continued)

NOTE

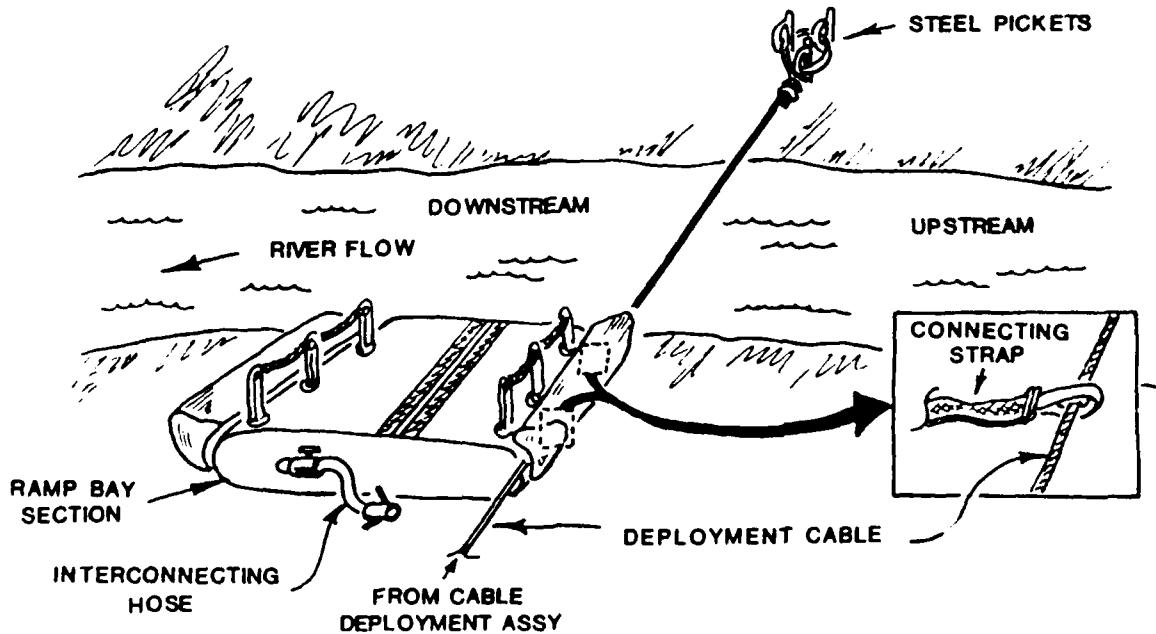
When joining the quick-disconnect couplings, ensure that both fittings are clean. Check that the female coupling has a serviceable gasket. Lock connection by simultaneously pushing both cam lever arms fully closed.

6. Connect interconnecting hose assembly to uncapped ramp bay air inlet fitting.
7. Turn valve handle on interconnecting hose to OPEN.
8. Connect inflation hose to interconnecting hose.
9. Position inflation system on/off switch to ON.
10. Move ramp bay material as necessary to aid the inflation process.

NOTE

The inflation system shuts off automatically when operational pressure is reached.

11. Close valve between ramp bay and inflation system.
12. Turn inflation system on/off switch to OFF.
13. Disconnect inflation hose from interconnecting hose.
14. Disconnect pressure sensing line from ramp bay.
15. Connect two straps on side of ramp bay to deployment cable. Attach bay sections on downstream side cable (See figure below).



Installing 1ST Ramp Bay Section - (Continued)

16. Adjust length of connecting straps if needed, allowing ramp bay bottom to contact river.
17. Slide the ramp bay into river, leaving about 1/4 of ramp bay (about 5 ft.) on river bank.

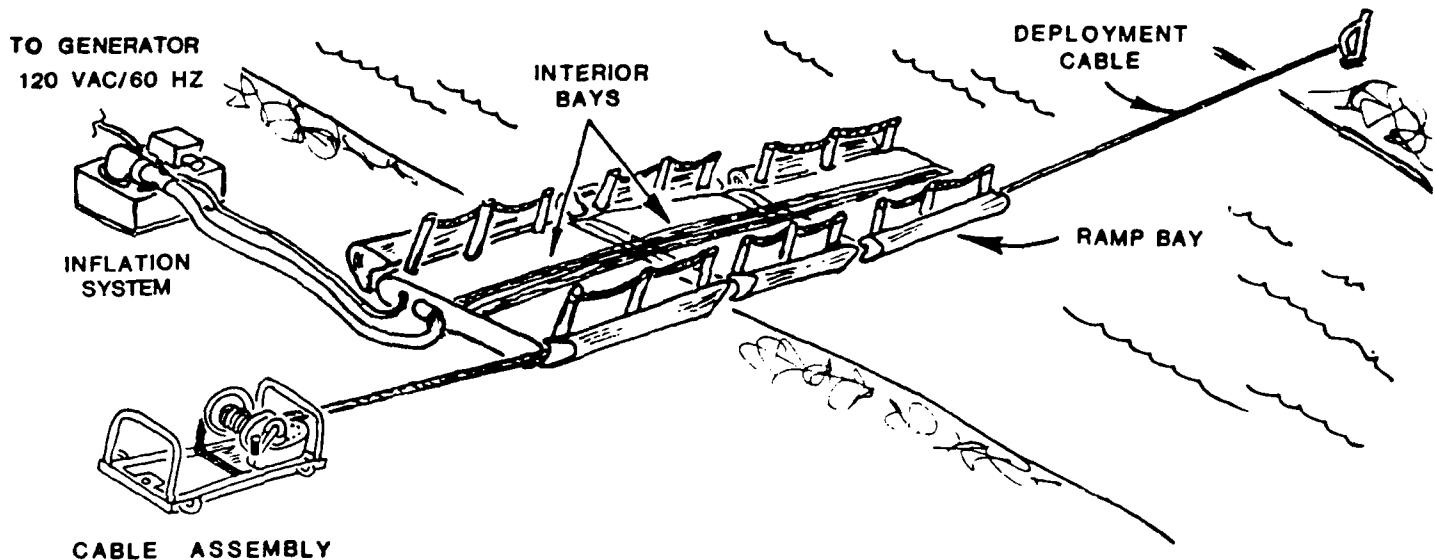
Installing Interior Bay Sections

1. Unpack interior bay assembly from shipping container.
2. Place interior bay assembly on cleared assembly area.
3. Unfold interior bay assembly.

NOTE

Position the interior bay next to the ramp bay and align roadway yellow center stripes.

Bay assemblies will be attached to each other to form a chain (See figure below).



Installing Interior Bay Sections - (Continued)

4. Inflate interior bay as follows:

- a. Remove protective caps from interior bay inflation ports.

NOTE

When joining the quick-disconnect couplings, ensure that both fittings are clean. Check that the female receptacle has a serviceable gasket.

To lock connection, simultaneously push both cam lever arms fully closed.

- b. Attach interconnecting hose from ramp bay to interior bay.

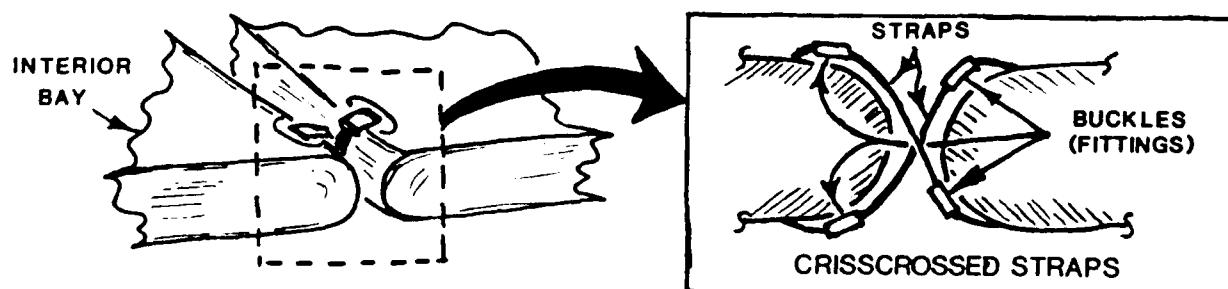
CAUTION

Failure to connect the pressure sensing line to the section being inflated may result in over-pressurization. Damage to equipment may result.

- c. Connect pressure sensing hose to interior bay.
- d. Attach interconnecting hose to interior bay inflation port located on exposed end and open manual valve.
- e. Connect inflation hose to interconnecting hose.
- f. Position inflation system on/off switch to ON.
- g. Open valve located between ramp and interior bay.
- h. Connect hook and pile on joining roadway flaps.
- i. Attach bay to bay attachment straps.

NOTE

Straps connect to upper and lower black plastic fittings located near each joining corner (See figure below).



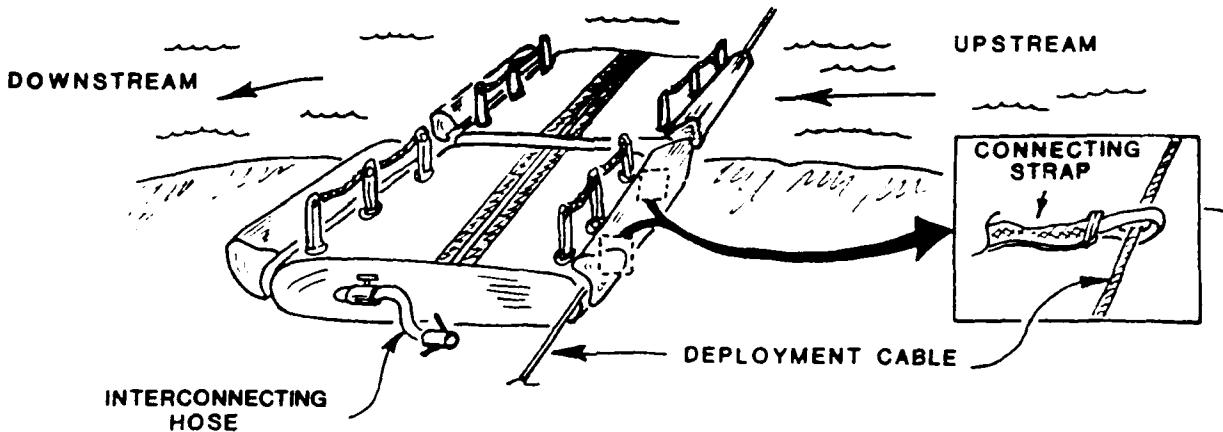
Installing Interior Bay Sections - (Continued)

- j. Move interior bay material as necessary to aid inflation process.

NOTE

The inflation system shuts off automatically when operational pressure is reached.

- k. Close valve between interior bay and inflation system.
l. Position inflation system on/off switch to OFF.
m. Remove inflation hose from interconnecting hose.
n. Remove pressure sensing hose from interior bay.
o. Connect straps on side of interior bay to deployment cable (See figure below).



- p. Adjust length of connecting straps as needed, allowing interior bay bottom to contact river.
q. Slide interior bay into river, leaving about 1/4 of interior bay (about 5 ft.) on river bank.

NOTE

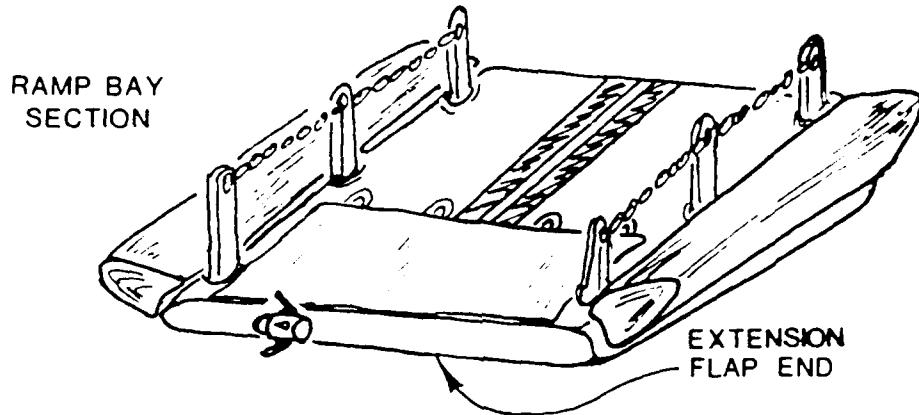
Repeat steps 1 thru 4 to install additional interior bays. After enough interior bays have been installed proceed with the installation of the remaining ramp bay assembly.

Installing 2ND Ramp Bay Section

1. Unpack ramp bay assembly from shipping jacket.
2. Place ramp bay assembly on cleared assembly area.
3. Unfold ramp bay assembly.

NOTE

Orient the end opposite the extension flap next to the inflated interior bay; and align roadway yellow center stripes. The extension flap end of the ramp bay assembly should be pointing towards the access roadway (See figure below).



4. Attach ramp bay to interior bay as follows:
 - a. Remove protective caps from ramp bay inflation ports.

NOTE

When joining the quick-disconnect couplings, ensure that both fittings are clean. Check that the female receptacle has a serviceable gasket.

To lock connection, simultaneously push both cam lever arms fully closed.

- b. Attach interconnecting hose from ramp bay to interior bay.
 - c. Attach interconnecting straps.

NOTE

Straps connect to upper and lower black plastic fittings located near the joining ramp and interior bay corners.

Installing 2ND Ramp Bay Section - (Continued)

5. Inflate ramp bay as follows:

CAUTION

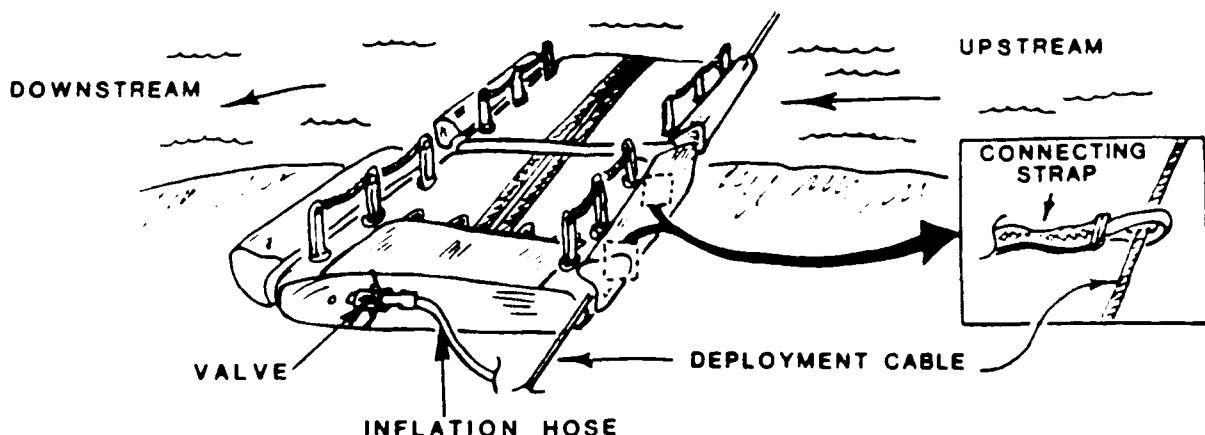
Failure to connect the pressure sensing line to the section being inflated may result in over-pressurization. Damage to equipment may result.

- a. Connect pressure sensing hose to ramp bay.
- b. Connect inflation hose to ramp bay inflation port located on extension flap end of ramp assembly.
- c. Open valve on ramp bay inflation port.
- d. Position inflation system on/off switch to ON.

NOTE

When operational pressure is reached, the inflation system shuts off automatically. The inflation system is left connected to the ramp bay. The inflation system remains on and automatically maintains operating pressure throughout the duration of the bridge deployment.

- e. Move ramp bay material as necessary to aid inflation process.
- f. Connect straps on side of ramp bay to deployment cable (See figure below).



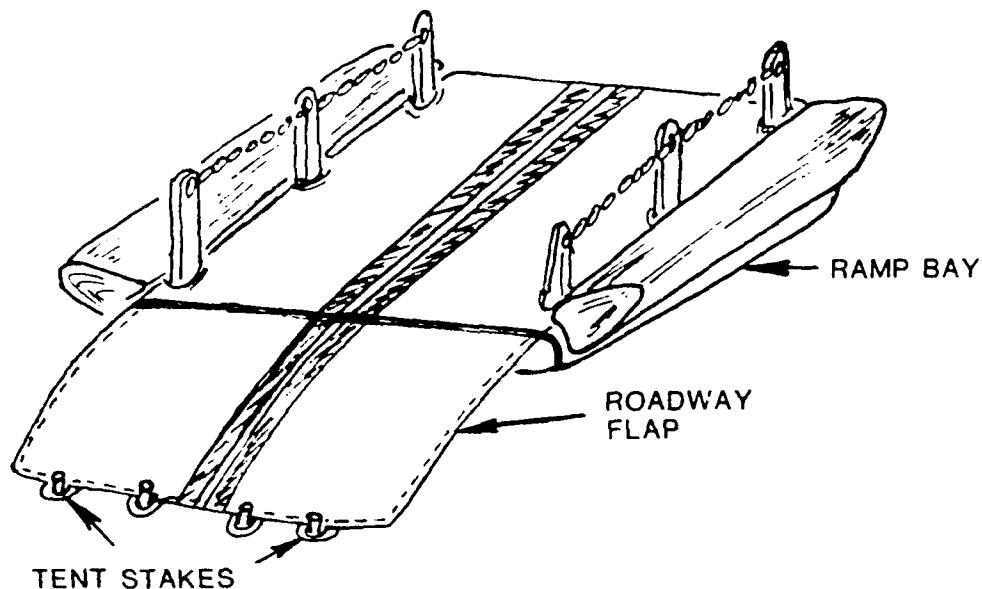
- g. Adjust length of connecting straps as short as possible, allowing ramp bay bottom to contact river.
- h. Connect hook and pile on joining roadway flaps.

Installing 2ND Ramp Bay Section - (Continued)

- i. Slide ramp bay into river, leaving about 1/4 of ramp bay (about 5 ft.) on river bank.
- j. Extend extension flap and secure with tent stakes (See figure below).

NOTE

Repeat step (k) for ramp bay at other end of bridge.



Installing Shore Guy Lines

General Comments

Shore guy lines are installed for two reasons. The first is to replicate guy lines on a real ribbon bridge; and the second is to provide additional mooring of the decoy bridge against river currents and wind loads.

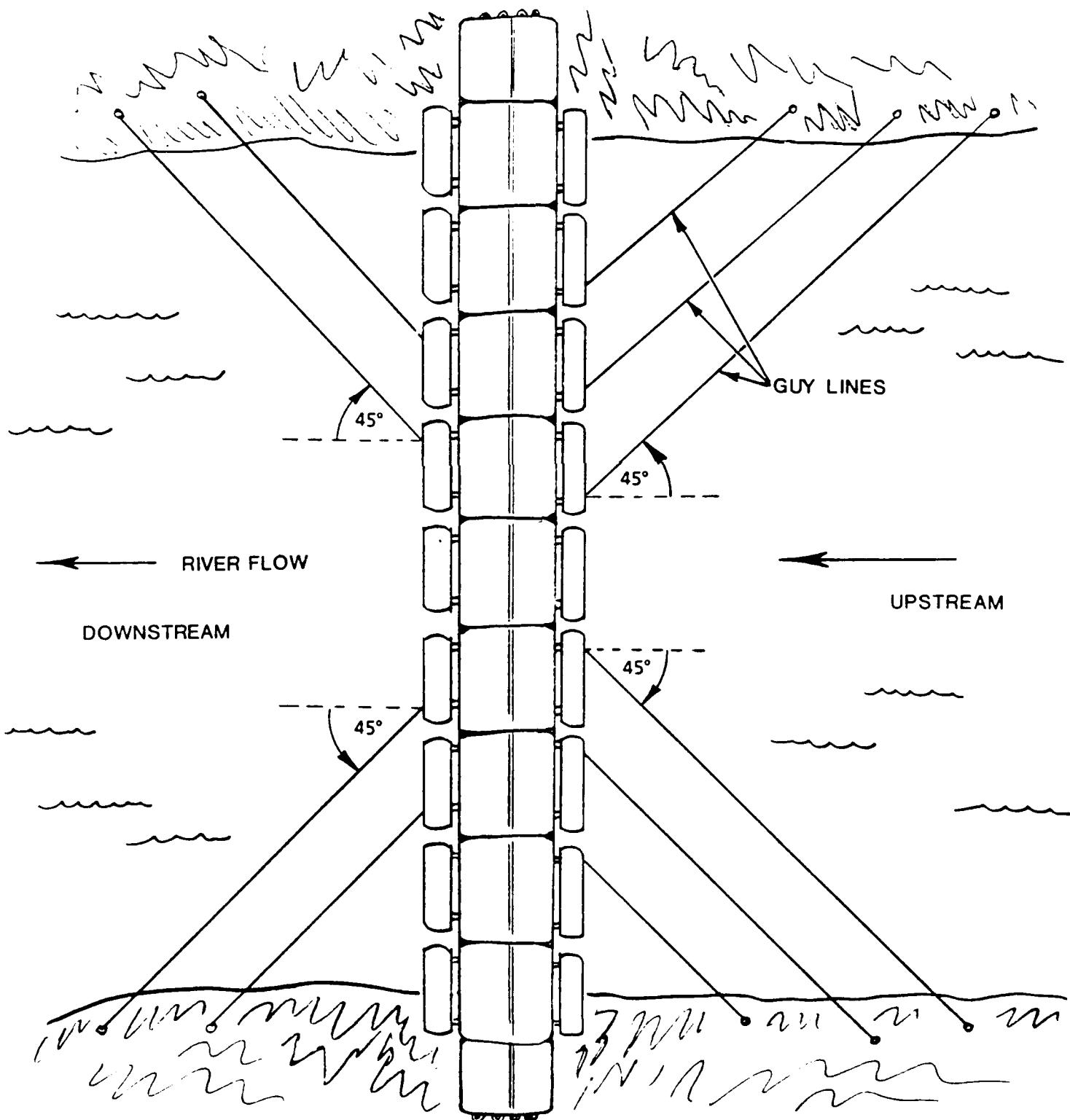
The quantity of shore guy lines to be deployed will depend on length of the bridge.

The location of shore guy lines will be such to replicate an actual ribbon bridge, while increasing mooring strength.

Shore guy lines should be positioned and rigged at a nominal angle of 45° with the bridge (See figure next page).

Installing Shore Guy Lines - (Continued)

Typical Shore Guy Line Installation



Installing Shore Guy Lines - (Continued)

NOTE

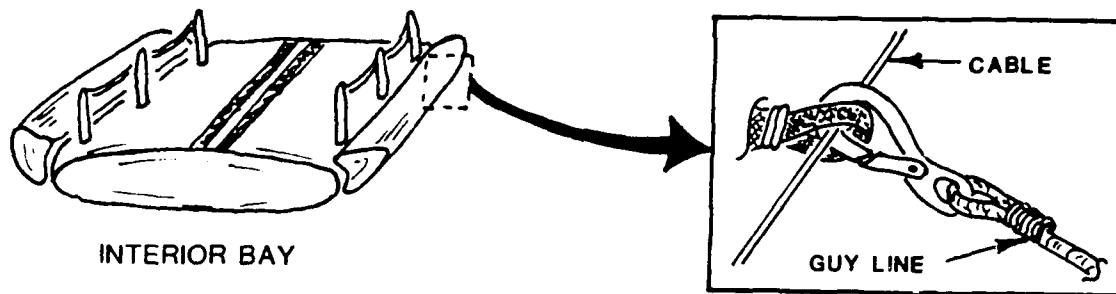
Attach the upstream shore guy lines first. Start with the interior bay attachment points nearest the river banks, alternating sides until all upstream guy lines are installed. Repeat the sequence when installing the down-stream shore guy lines. Start with attachment points nearest the river banks, alternating sides until all downstream guy lines are installed.

1. Identify location and number of attachment points desired.

CAUTION

Use care during temporary mooring of raft or boat. Protruding objects could damage inflated bays.

2. Attach shore guy line to bridge (See figure below).



3. Locate 45° anchor point on river bank.
4. Extend shore guy line to anchor point.
5. Drive steel picket into the river bank at anchor point.
6. Secure shore guy line to steel picket.
7. Repeat steps 1 thru 6 to install remaining upstream guy lines.

AFTER ALL UPSTREAM GUY LINES ARE INSTALLED

8. Install shore guy lines on downstream side of bridge.
9. Repeat steps 1 thru 6 to install remaining downstream guy lines.

Installing Camouflage

General

If possible, camouflage all visible equipment not used in the operation of an actual ribbon bridge. For example: deployment equipment, inflation system, portable generator, and any packaging materials which may be left at the site. Camouflage by using local foliage or any other material which is common to the local environment. Standard camouflage netting may also be used.

BRIDGE DISASSEMBLY

Removing Camouflage

Remove all camouflage from the decoy ribbon bridge and associated support equipment that has been covered for concealment purposes.

Removing Shore Guy Lines

NOTE

Starting with the centermost guy lines on the downstream side, alternately disconnect guy lines until all downstream lines are disconnected.

1. Disconnect shore guy line from steel picket.
2. Remove steel picket.
3. Disconnect guy line from interior bay attachment strap.
4. Rollup shore guy line.
5. Repeat steps 1 thru 4 to remove remaining downstream guy lines.

AFTER ALL DOWNSTREAM GUY LINES ARE REMOVED

NOTE

Repeat the sequence when removing upstream shore guy lines. Start with the centermost lines, alternating sides until all upstream guy lines have been removed.

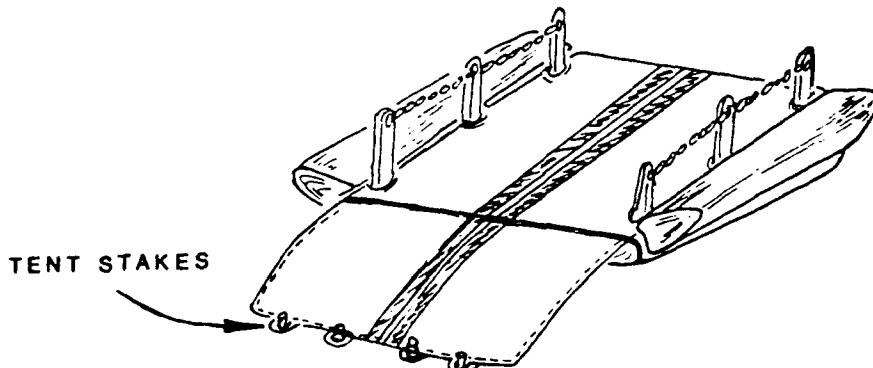
6. Repeat steps 1 thru 4 until all upstream guy lines are removed.

Removing Ramp and Interior Bay Sections

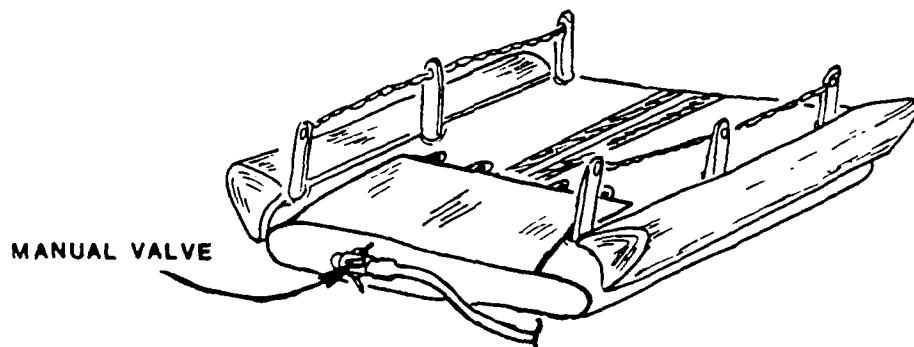
NOTE

Ramp and interior bay sections must be deflated one at a time. Pressure is maintained in the remaining bridge assembly as each section is detached and deflated. Steps 6 thru 17 are repeated to remove and deflate each additional bay section.

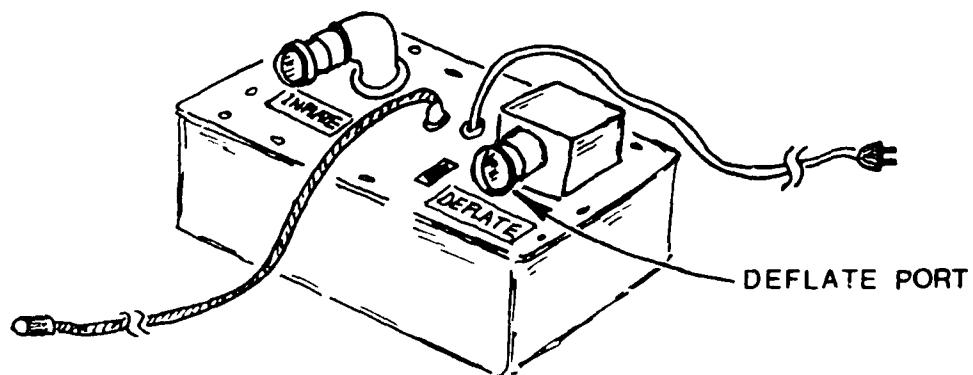
1. Remove four (4) stakes securing ramp bay extension flap and fold extension flap back on top of ramp bay. Perform this step for both ramp bays before proceeding (See figure below).



2. Close valve on ramp bay inflation port.

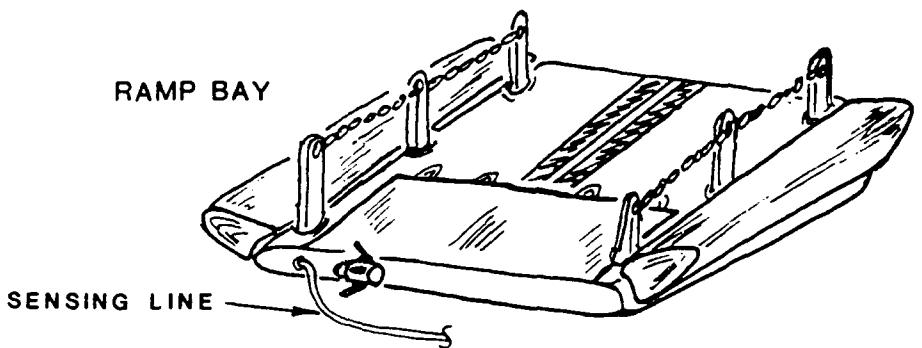


3. Turn inflation system on/off switch to OFF.
4. Move inflation hose from INFLATE port to DEFFLATE port.

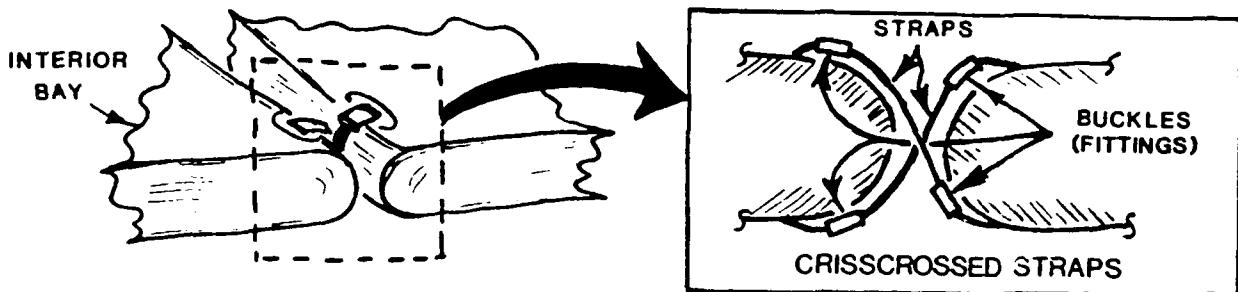


Removing Ramp and Interior Bay Sections - (Continued)

5. Disconnect pressure sensing line from ramp bay.



6. Pull ramp/interior bay up onto river bank.
7. If not already connected, connect inflation (deflate) hose to interconnecting hose of interior/ramp bay being deflated.
8. Close valve between ramp/interior bay to be deflated and remaining inflated bridge bay sections.
9. Disconnect and remove four (4) bay to bay attachment straps. (Place in carrying bag.)



10. Remove connecting straps from deployment cable.
11. Disconnect hook and pile joining roadway flaps.

CAUTION

Do not remove interconnecting hose assembly from the remaining inflated bridge sections. If this happens, the bridge assembly pressure will be depleted and the bridge will collapse. Ensure that valve on hose assembly is closed.

12. Remove interconnecting hose end (connecting remaining bridge assembly) from ramp/interior bay to be deflated.

Removing Ramp and Interior Bay Sections -(Continued)

13. Allow air to expel from ramp/interior bay.
14. Move ramp/interior bay material as necessary to aid deflation.
15. Place protective cap over ramp/interior bay inflation fitting.

NOTE

Lock protective cap in place by simultaneously pushing both cam lever arms fully closed.

16. Open valve between partially deflated ramp/interior bay and inflation system.
17. Turn inflation system on/off switch to ON.
(This will vacuum remaining air from ramp/interior bay.)

NOTE

It may be necessary to throttle air flow by partially closing the valve to prevent bay material from blocking air discharge port.

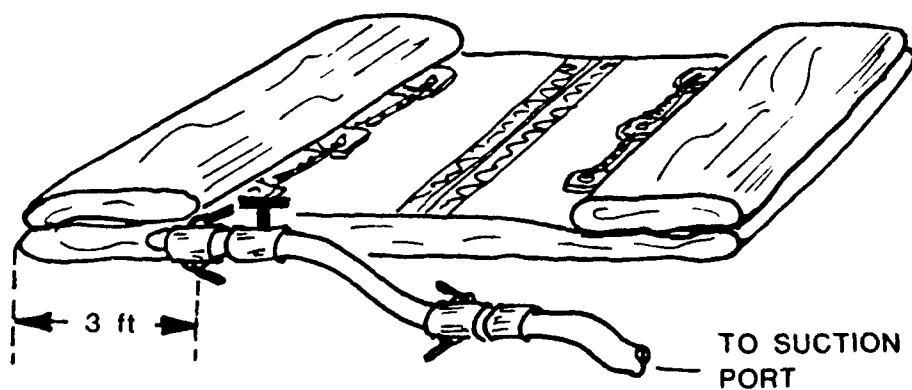
Partial folding of the pontoon sections may be necessary to fully expel air from bay assembly.

Manually evacuate as much air as possible from the bridge bay section by forcing air out while compressing air chambers.

AFTER EXPELLING AS MUCH AIR AS POSSIBLE

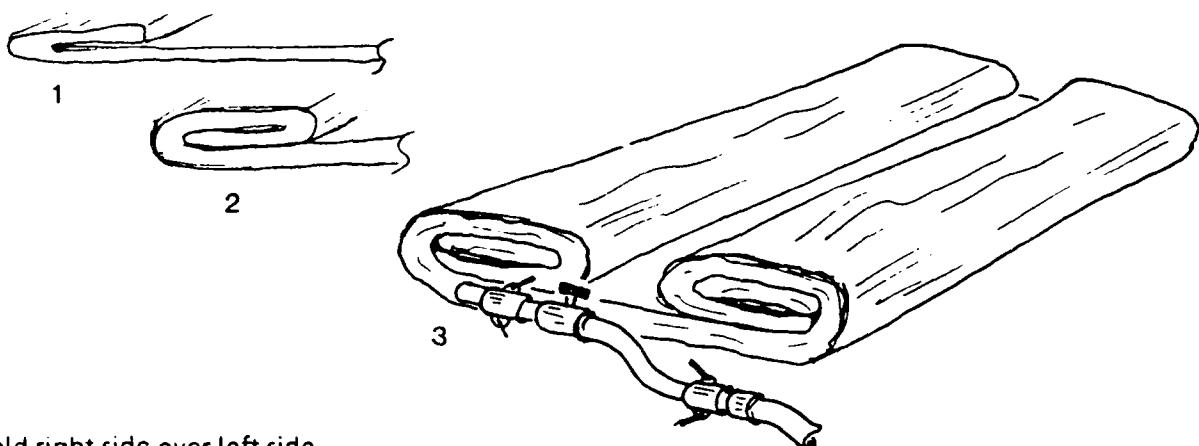
Folding Ramp and Interior Bay Sections

1. Fold side handrail posts into center of bay section.
2. Fold each pontoon side in about 3 ft toward center stripes.

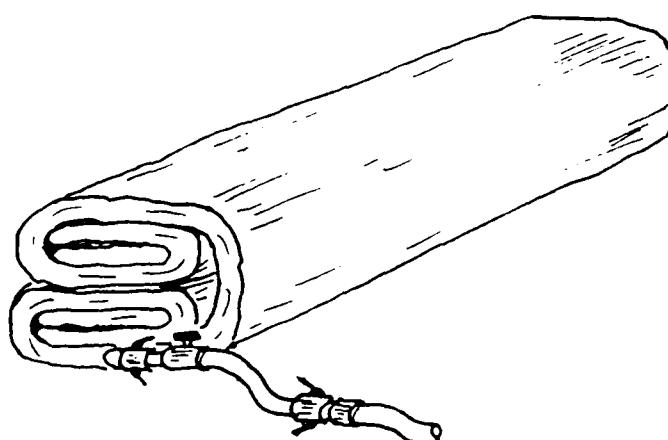


Folding Ramp and Interior Bay Sections - (Continued)

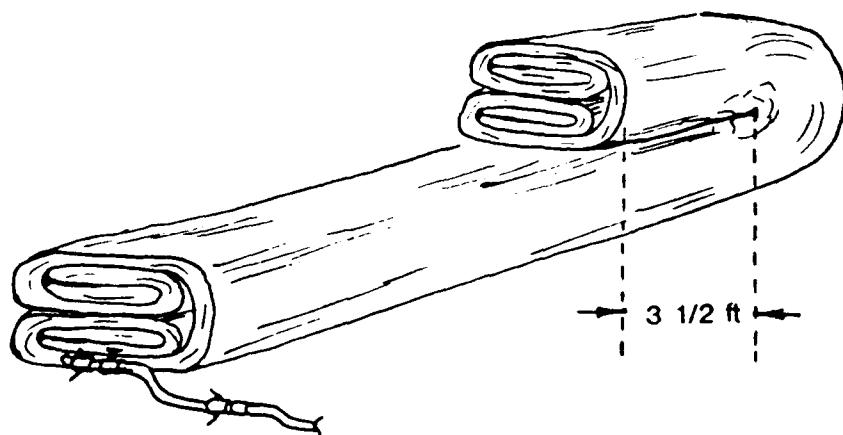
3. Fold each side in an additional two folds.



4. Fold right side over left side.



5. Starting at opposite end from inflation system connection, fold end in lengthwise about $3\frac{1}{2}$ ft.
6. Make additional folds until bay section is completely folded.



Folding Ramp and Interior Bay Sections - (Continued)

7. Turn inflation system on/off switch to OFF.
8. Disconnect inflation hose from folded ramp/interior bay.
9. Remove interconnecting hose from folded ramp/interior bay.
10. Place protective cap on ramp/interior bay air inlet fitting.

NOTE

Lock protective cap into place by simultaneously pushing both cam lever arms fully closed.

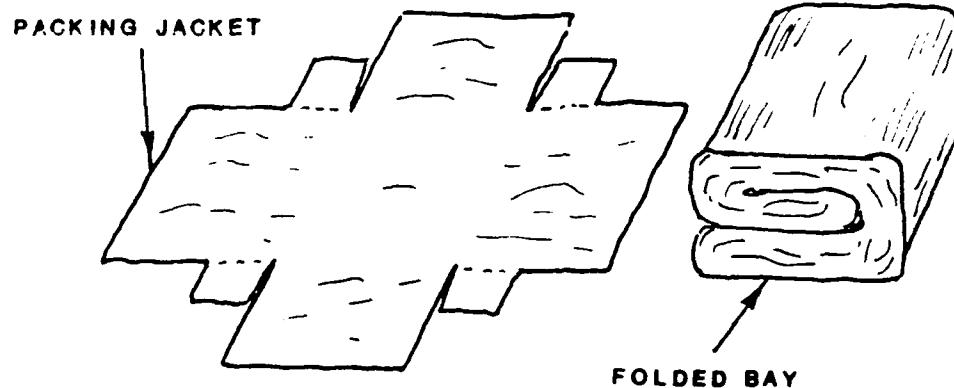
11. Place interconnecting hose in carrying bag.
12. Repeat steps 1 thru 11 to fold additional bays.

Packing Ramp and Interior Bay Sections

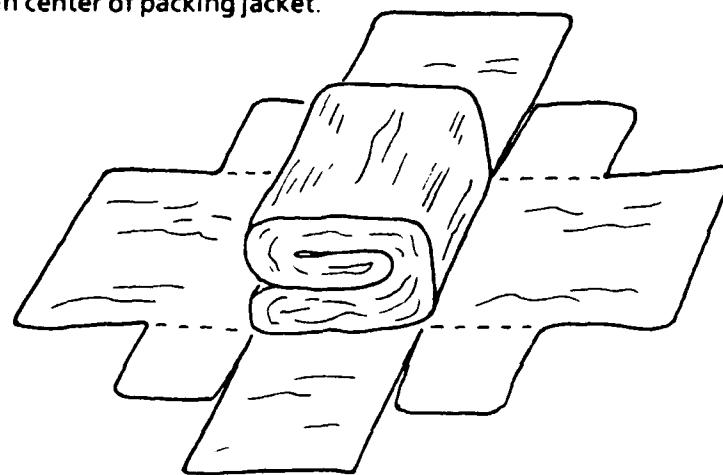
1. Unfold fabric packing jacket next to folded bay.

NOTE

Orient packing jacket with webbed cinching straps on bottom facing the ground.

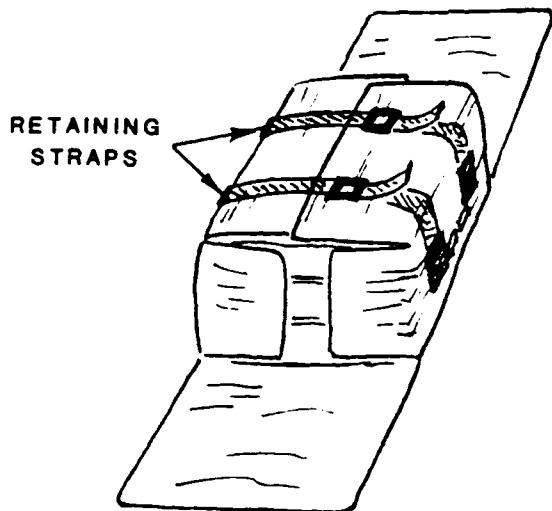


2. Place folded bay in center of packing jacket.



Packing Ramp and Interior Bay Sections - (Continued)

3. Wrap sides with flaps over folded bay.
4. Connect and tighten two (2) webbed retaining straps.

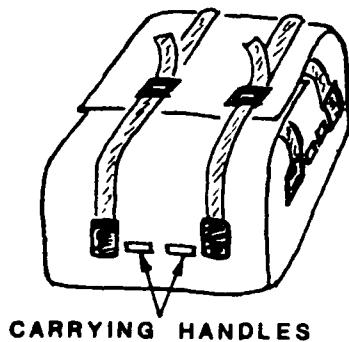


5. Fold side flaps in around folded bay.
6. Wrap remaining sides up and over top of folded bay.

NOTE

Ensure that side flaps are tucked in before making the final cinching of webbed retaining straps.

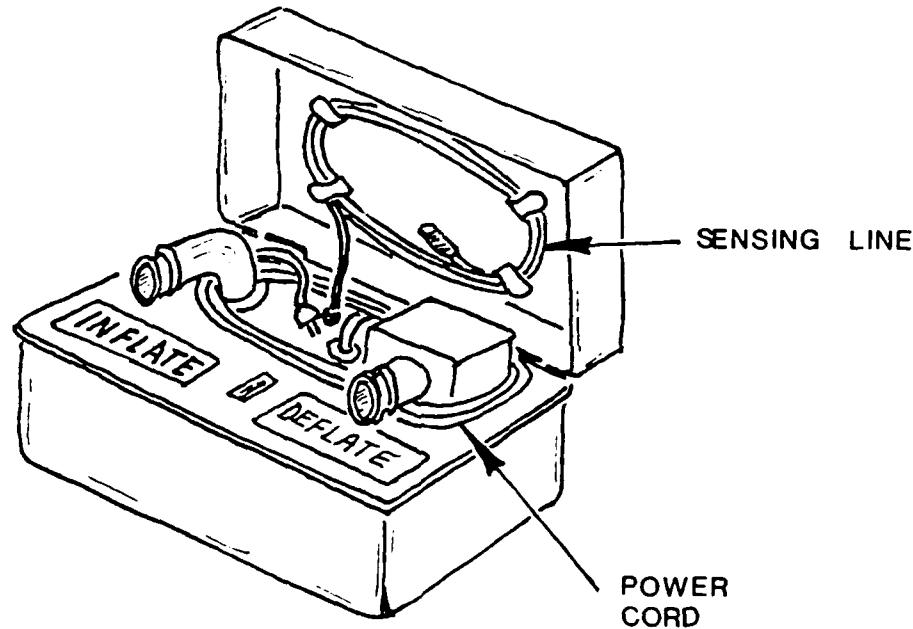
7. Connect and tighten two (2) webbed retaining straps.



8. Place packed bay assembly at shipping pickup point.
9. Repeat the removing, folding, and packing procedures for each ramp/interior bay section being dismantled.

Storing Inflation System

1. Shutdown and secure generator in accordance with appropriate generator operating instructions.
2. Disconnect inflation system power cord from generator.
3. Remove inflation hose from the suction port.
4. Coil power cord around filter housing and inflate port.
5. Stow pressure sensing line in inflation system lid.



6. Close and latch inflation system lid.

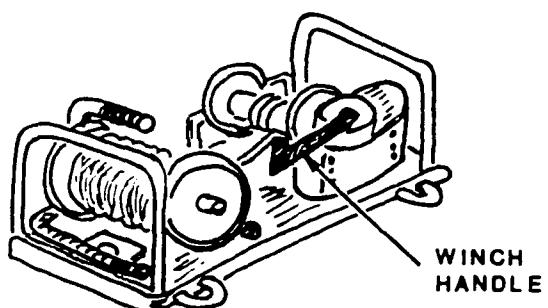
NOTE

Be sure inflation system lid is securely latched to prevent the intrusion of dirt and dust during transportation and storage.

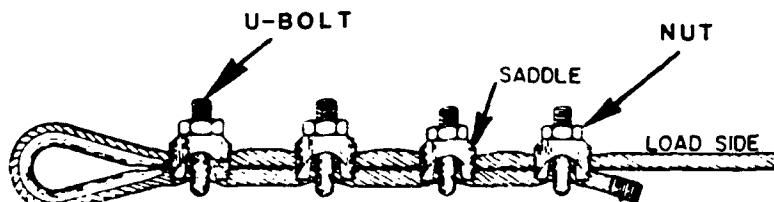
7. Pack inflation system in crate or box prior to shipment.

Removing Cable Assembly

1. Release tension on deployment cable by turning winch handle counterclockwise.



2. Use ratchet wrench to remove four U-bolts securing cable on opposite side of river.



3. Store ratchet wrench and U-bolts in carrying bag.
4. Retrieve steel pickets used to anchor cable.
5. Place equipment in boat or raft used for river crossing.

WARNING

Gloves should be worn when handling cable to prevent cuts, scrapes, and skin punctures caused by a frayed cable.

6. Partially wind cable on spool and place spool in boat or raft.
7. Pull cable into raft or boat as you cross river to other side.

NOTE

Neatly coil cable in raft. This will prevent tangling of cable and make respooling of cable much easier when on the river bank.

8. Remove all equipment from boat and place on river bank.

Removing Cable Assembly - (Continued)

WARNING

Gloves should be worn when handling cable to prevent cuts, scrapes, and skin punctures caused by a frayed cable.

9. Wind coiled cable neatly onto deployment spool.
10. Remove anchor rigging from cable deployment assembly.
11. Place cable spool back onto frame.
12. Connect and tighten spool retaining strap.
13. Pack cable deployment assembly, steel pickets, U-bolts, and ratchet wrench in crate or box prior to shipment.

CHAPTER 3

EQUIPMENT MAINTENANCE

GENERAL

Personnel selected to perform decoy ribbon bridge repair work should have a knowledge of the hazards involved. Refer to chapter one safety summary to review the general hazards. They should also be familiar with the operation and limitations associated with the decoy ribbon bridge.

Damaged bay sections should be isolated and removed from the deployed decoy ribbon bridge assembly before attempting these repair procedures.

Permanent repairs can be made at the deployed site if ambient temperature is between 60°F and 85°F. Inclement weather or cold temperatures may require the ramp or interior bay section to be moved under a canopy or open face structure (such as a dock), or into an enclosed building for repairs.

NORMAL REPAIR PROCEDURES

Installing External Repair Patches

WARNING

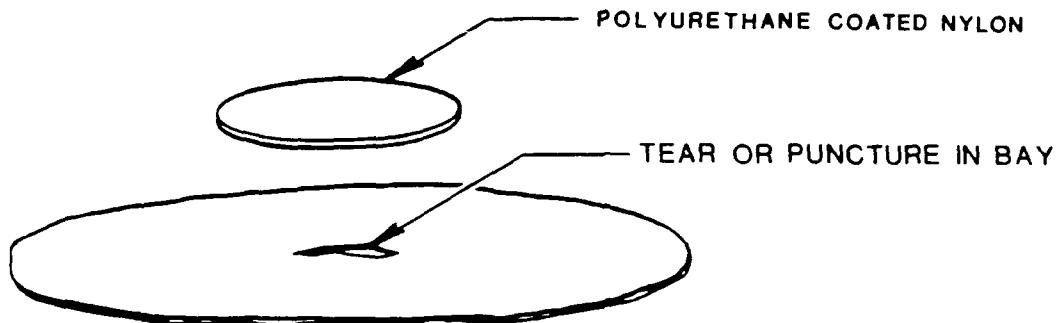
Solvents used to make permanent repairs are flammable. Do not perform these repair procedures in enclosed buildings without the use of adequate ventilation. Make repairs in a dry, well ventilated area away from open flames.

Ensure that adequate operable fire extinguishing equipment is available and that repair persons are trained to use them.

Bay sections can be slippery when wet. Avoid walking on wetted material if at all possible. If walking on wetted material is necessary, walk with caution.

1. Remove all loose coating back to where coating is tightly adhered to fabric.
2. Obtain patch of Polyurethane coated repair material.
3. Cut patch of repair material large enough to extend at least one inch beyond damaged area in all directions.
4. Use Methyl Ethyl Ketone (MEK) to clean both bay area to be patched and mating surface of patch to be applied. Cover area at least 2 inches larger than patch.

Installing External Repair Patches -(Continued)



5. Apply one coat of urethane adhesive to joining surfaces of bay and patch material.
6. Let coated areas dry for one hour.
7. Apply second coat of urethane adhesive to joining surfaces of bay and patch material.
8. Let adhesive become tacky.
9. Place patch over prepared area of damaged bay material.
10. Roll patch with small roller until surfaces are thoroughly joined.

NOTE

Allow repaired material to dry for about one hour before moving bay section.

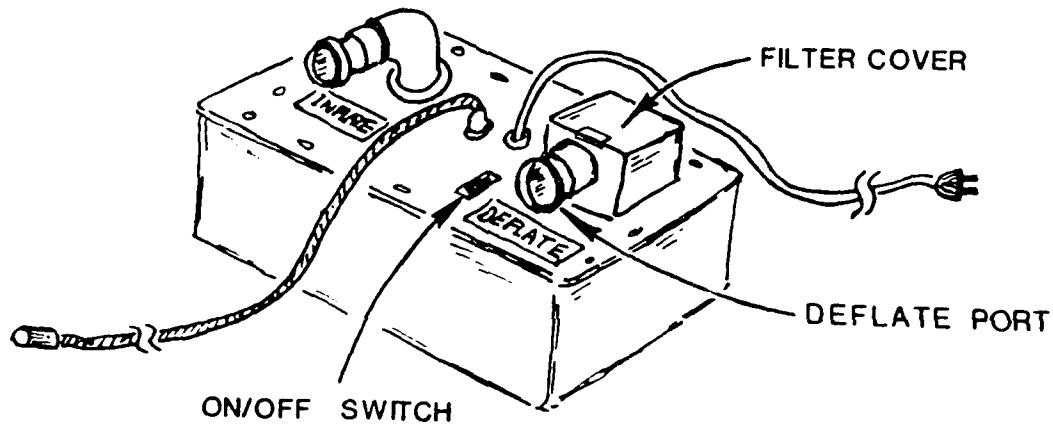
Allow the repair adhesive to cure for a minimum of 24 hours before putting the bay section in use.

Inflation Assembly Inlet Filter Cleaning/Replacement

1. If unit is running, position on/off switch to OFF.
2. Unlatch and raise cover on deflate port assembly.
3. Remove air filter screen material.
4. Remove loose dirt from filter.

Inflation Assembly Inlet Filter Cleaning/Replacement - (Continued)

5. Clean filter in soapy water, rinse and allow to dry.
6. Re-install filter in deflate port assembly.
7. Close cover and secure latch.
8. Position on/off switch to ON when ready to restart unit.

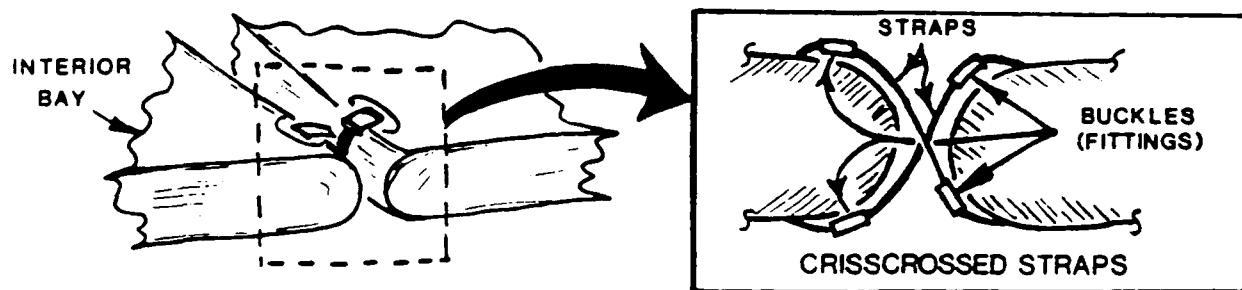


EMERGENCY REPAIR PROCEDURES

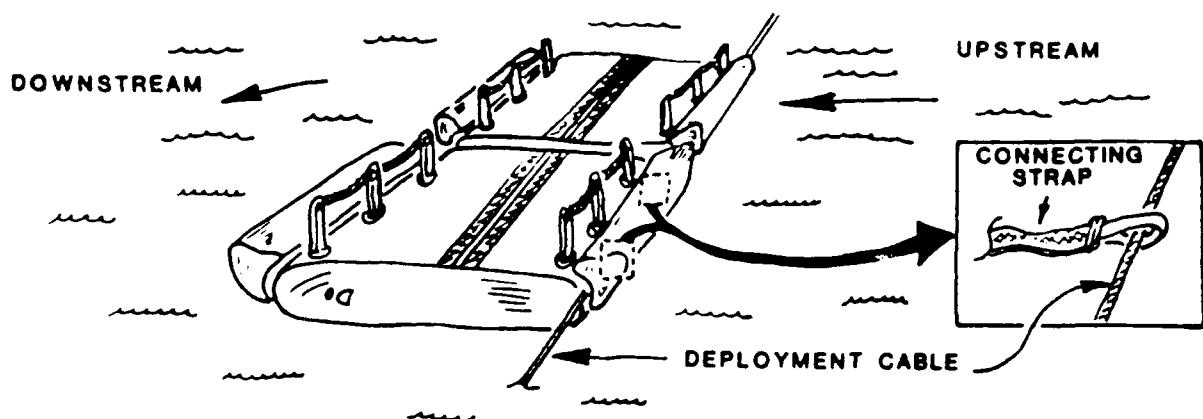
Bay Replacement Procedures

- REMOVAL

1. Place raft or boat in river, on deployment cable side of bridge (upstream side).
2. If guy line is used, disconnect guy line from affected bay and temporarily install guy line to an adjacent bay.
3. Proceed to far side of affected bay.
4. Disconnect bay to bay attachment straps from far end of affected bay and separate roadway flap hook-and-pile as much as possible.

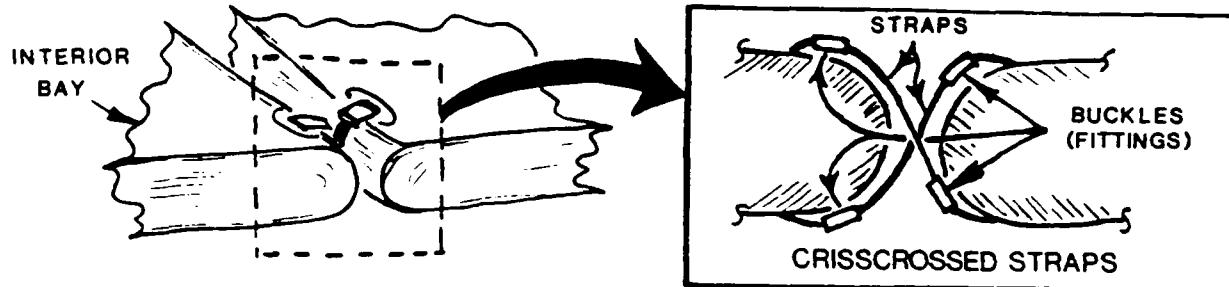


5. Disconnect connecting straps on affected bay from deployment cable.



Bay Replacement Procedures - (Continued)

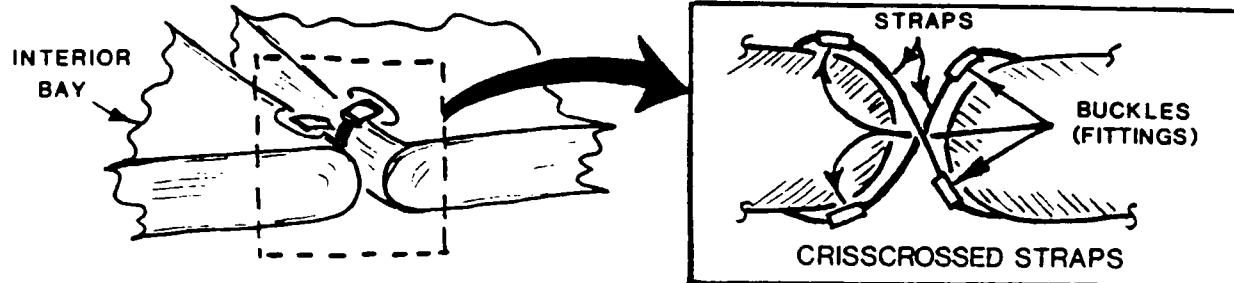
6. Disconnect bay to bay attachment straps from other end of affected bay and separate roadway flap hook-and-pile as much as possible.



7. Move raft or boat to other side of bridge (downstream side).
8. If guy line is used, disconnect guy line from affected bay and temporarily install guy line to an adjacent bay.
9. Proceed to far side of affected bay.
10. Tie first tow line to handle located on far end of affected bay.
11. Disconnect bay to bay attachment straps from far end of affected bay and complete separate roadway flap hook-and-pile.
12. Close valve on interconnecting hose joining affected bay to bridge.
13. Disconnect interconnecting hose from affected bay, ensuring hose stays with adjacent bay that is not affected.
14. Tie second tow line to handle located on other end of affected bay.

Bay Replacement Procedures - (Continued)

15. Disconnect bay to bay attachment straps from other end of affected bay and completely separate roadway flap hook-and-pile.



16. Close valve on interconnecting hose joining affected bay to bridge.
17. Disconnect interconnecting hose from affected bay, ensuring hose stays with adjacent bay that is not affected.
18. Using tow lines, pull affected bay from bridge assembly and tow to shore for repacking.

- **INSTALLATION**

1. Turn inflation system on/off switch to OFF.
2. Close valve on ramp bay where inflation hose is connected.
3. Remove inflation hose from ramp bay.
4. Remove pressure sensing line from ramp bay.
5. Unpack bay that is going to be used in replacement of affected bay.
6. Install protective cap on inflation port, opposite side of bay from which inflation will take place.
7. Remove protective cap on inflation port to be used for inflating bay.

Bay Replacement Procedures - (Continued)

NOTE

When joining the quick-disconnect couplings, ensure that both fittings are clean. Check that the female receptacle has a serviceable gasket.

To lock connection, simultaneously push both cam lever arms fully closed.

8. Connect interconnecting hose to bay inflation port.
9. Connect inflation hose to interconnecting hose.

CAUTION

Failure to connect the pressure sensing line to the section being inflated may result in over-pressurization. Damage to equipment may result.

10. Connect pressure sensing line to bay section.
11. Open valve on interconnecting hose.
12. Position inflation system on/off switch to ON.
13. Move bay material as necessary to aid inflation process.

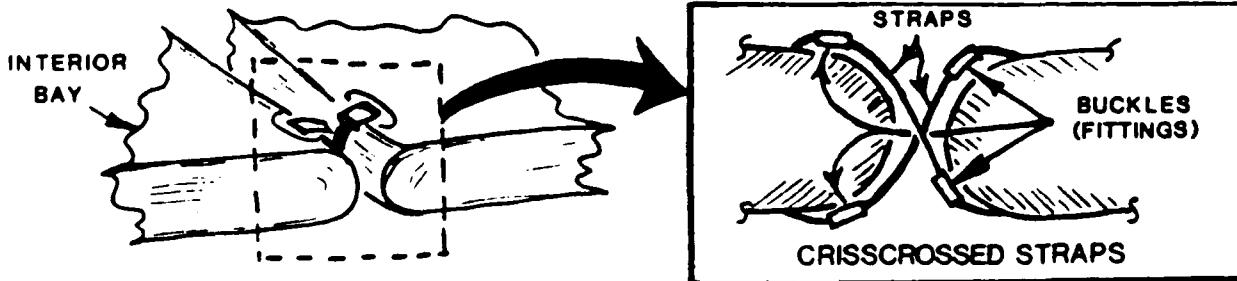
NOTE

The inflation system shuts off automatically when operational pressure is reached.

14. Close valve on interconnecting hose.
15. Remove interconnecting hose from bay inflation port and quickly install protective cap on bay inflation port.
16. Remove pressure sensing line from bay.
17. Remove interconnecting hose from inflation hose.
18. Re-install pressure sensing line to ramp bay.
19. Re-install inflation hose to ramp bay inflation port.
20. Open valve on ramp bay inflation port.
21. Position inflation system on/off switch to ON.

Bay Replacement Procedures - (Continued)

22. Tie tow lines to each of the end handles on one side of the bay.
23. Place replacement bay into river on side opposite of deployment cable (downstream side).
24. Tow replacement bay to area of bridge where affected bay was removed.
25. Position bay section into open area of bridge.
26. Connect bay to bay attachment straps at end closest to inflation system.
27. Remove cap from replacement bay inflation port, closest to inflation system, and quickly connect interconnecting hose from adjacent bay to prevent excessive loss of pressure.
28. Open valve on interconnecting hose.
29. Connect roadway flap hook-and-pile as much as possible.
30. If used, remove guy line that was temporarily installed to adjacent bay and connect it to replacement bay.
31. Proceed to other end of bay and connect bay to bay attachment straps.
32. Remove cap from replacement bay inflation port, farthest from inflation system, and quickly connect interconnecting hose from adjacent bay to prevent excessive loss of pressure.
33. Open valve on interconnecting hose.
34. Connect roadway flap hook-and-pile as much as possible.
35. Move boat or raft to deployment cable side of bridge (upstream side).
36. Connect bay to bay attachment straps on end farthest from deployment shore line and completely connect roadway flap hook-and-pile.
37. Connect interconnecting straps (2 ea.) to deployment cable.
38. If used, remove guy line that was temporarily installed to adjacent bay and connect it to replacement bay.
39. Connect bay to bay attachment straps on end nearest to deployment shore line and completely connect roadway flap hook-and-pile.



CHAPTER 4

MATERIAL PARTS LIST

GENERAL

(Information to be supplied)

MANUFACTURER PARTS LIST

Component	Qty	P/N
Ramp Bay Assembly	2	SK8274-10166-01
Interior Bay Assembly	As Req	SK8274-10165-01
Interconnecting Hose Assy	As Req	SK8274-10206-01
Inflation Hose Assembly	1	SK8274-10207-01
Inflation System Assembly	1	SK8274-10217-01
Shore Rope Assembly (230 ft)	As Req	SK8274-10241-01
Shore Rope Assembly (150 ft)	As Req	SK8274-10241-02
Shore Rope Assembly (90 ft)	As Req	SK8274-10241-03
Cable Deployment Assembly	1	SK8274-10209-01
U-Bolt Cable Clamp	4	TBS
Ratchet Wrench Assembly	1	TBS
Steel Picket, Type II	As Req	NSN 5420-00-371-9897
Bay Strap Assembly	As Req	SK8274-80179-01
Tent Stakes	8	TBS

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